

A preliminary study on the toxicity of the sponge Haliclona rubens (Pallas) de Laubenfels

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A high degree of toxicity was found in the sponge *Haliclona rubens*. The toxin was extracted by homogenizing 4 g of live sponge in each of the following solvents: hexane, benzene, ether, chloroform, acetone, ethanol, methanol, and distilled water. After centrifugation and evaporation of the supernatant, the extracts were tested against squirrelfishes (*Holocentrus rufus*). The behavior of the fish was observed and timed. Control experiments were run each time.

A coefficient of toxicity (α) was calculated according to the following formula: $\alpha = \frac{xt}{y} \times 100$ where: x = weight of the toxin, y = weight of the dead fish, t = time in which death of the fish occurs. The effectiveness of the toxin and its solubility are inversely proportional to the value. In the case of *H. rubens*, the most effective solvent (lowest α value) is acetone (0.28 g of acetone-toxin extract in 2 liters of sea water, killed a 53.2 g fish in 5.5 min.).

Aspects of the biology of the bluehead wrasse Thalassoma bifasciatum

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Because of its shallow water diurnal habits and non-retiring nature, the labrid genus *Thalassoma* is an appropriate organism for investigation of the morphological and behavioral adaptations that have contributed to the success of the suborder Labroidae in tropical marine shore waters. Pectoral muscular modifications, as well as extensive development of the cephalic lateralis system, correlate with observed behavior patterns. The behavioral contexts of the varied color patterns were tentatively identified and found to be rather consistent. The depth distribution was examined and thought to correlate with the environmental diversity of coralline areas, especially below 10 meters. The species is not uniformly distributed on all reef zones nor is there a uniform decline with depth, though a large percentage of the population is in water less than 30 meters. The species is an opportunistic micro-carnivore, including its cleaning behavior. Despite this latter behavior, it does not enjoy complete immunity from predation. Aggregate spawning by yellow phase fishes was repeatedly observed and analyzed into successive components. Spawning by bluehead phases was not observed but it is felt that such polymorphism may be an important key to the success of the Labroidae, many of whose members show similar patterns.

Observations on the associations and feeding of six species of prosobranch gastropods on Anthozoans

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The associations and predation of prosobranch gastropods on anthozoans was studied in Discovery Bay, Jamaica. *Coralliophila abbreviata* was associated with 12 scleractinian coral species, *Ricordea florida* (Actiniaria), and *Zoanthus sociatus* (Zoanthidea). *Coralliophila caribea* was associated with 6 stony corals, 3 gorgonians, *Zoanthus florida*, and the actiniarians *Rhodactis sanctithomae* and *Ricordea florida*. Two methods of feeding were observed for *Coralliophila*: the proboscis is inserted through the epidermis of corals into the gastrodermis where it is moved around; the proboscis is extended over the colony and inserted into the oral opening of an individual polyp. It could not be discerned what the *Coralliophila* were digesting, but zooxanthellae were found in the digestive tract.

Cyphoma gibbosum is associated with erect gorgonians. The many undigested zooxanthellae in its fecal pellets suggest that it mainly digests animal tissues.

Helicacis cylindricus and *H. infundibuliformis* (one individual each) were found among *Zoanthus florida* polyps. Feeding was not observed.

One *Calliostoma javanicum* (Trochidae) was found, and it consumed part of an *Agaricia agaricites* colony (scleractinian coral) in the laboratory. Its fecal pellets contained many undigested zooxanthellae and undischarged nematocysts which suggests that it might be digesting the animal tissue. This has been observed before at the Discovery Bay Marine Laboratory and is of interest since trochids are considered to be herbivores.

Relationships between type of locomotion, size, and speed in larger gastropod molluscs

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The speed and methods of locomotion in a wide size range of large Caribbean gastropod species were studied in order to determine the effects of absolute size on different types of locomotion. *Cittarium pica* and *Fasciolaria tulipa* move by retrograde alternate ditaxic waves of muscular contraction of the sole of the foot, *Strombus gigas* by leaping movements, and *Cassis* species apparently by ciliary action. Leaping is the fastest method of locomotion and ciliary movement is slowest in these large gastropods. Absolute speed on suitable horizontal substrates seems to increase with size over the size range of the species tested, and absolute speed on vertical or inclined substrates also increases but at a lower rate. These effects of weight on speed are most apparent in the species with ciliary locomotion and in *Fasciolaria tulipa*, in which adhesion at higher speeds is poor. Speed is inversely proportional to size in *Cittarium pica* but directly proportional to size in *Strombus gigas*. The limitations of the types of locomotion with absolute size are discussed with respect to different types of habitats.

Preliminary study of six Jamaican blue crabs, genus Callinectes (Decapods: Portunidae)

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Results of a summer study of Jamaican blue crabs are presented. Ecological separation between the six Jamaican species is discussed. Collecting localities for *Callinectes sapidus*, *C. bocourti* and *C. exasperatus* indicate that these prefer mud bottoms to sand bottoms; *C. danae* is found on both bottom types, while *C. marginatus* and *C. ornatus* are members of sandy bottom communities. *Callinectes bocourti* and *C. sapidus* males are found in fresh water rivers; *C. danae*, *C. exasperatus* and *C. sapidus* females live in estuaries and brackish bays while *C. marginatus* and *C. ornatus* are recorded from marine situations. Further separation based on feeding is proposed, with *C. exasperatus* and *C. marginatus* being able to exploit hard-bodied food organisms, while other species are not anatomically equipped to do so. An albinistic population of *Callinectes ornatus* is described in conjunction with implications on the evolutionary role of geographical isolation in speciation. Cannibalism is an important population control in *Callinectes* species. Laboratory studies of interspecific competition found males of *C. exasperatus* occupying the dominant position in shelter hierarchy while males of *C. bocourti* are more active in asserting feeding dominance in a two-species experiment. *Callinectes* species are found to be the largest and most active carnivores resident in estuarine and brackish environments on Jamaica's northern shore. Using a "Number of Features of Difference" table, a tentative phylogeny of six Jamaican and a seventh species of swimming crabs from the Pacific (Panama) is proposed. *Callinectes marginatus* and *C. exasperatus* are found to compose a closely related "species group" while *C. ornatus*, *C. danae* and *C. arcuatus* represent a second species group.